



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/752,255	01/06/2004	Patrick Anthony Coico	FIS919980039US3	4027
7590 12/03/2004			EXAMINER	
IRA D. BLECKER 2070 ROUTE 52 HOPEWELL JUNCTION, NY 12533			TRAN, THANH Y	
			ART UNIT	PAPER NUMBER
			2822	

DATE MAILED: 12/03/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/752,255

Applicant(s)

COICO ET AL.

Examiner

Thanh Y. Tran

Art Unit

2822

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 76-113 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 76-113 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>1/6/04</u> . | 6) <input type="checkbox"/> Other: ____.  |

**DETAILED ACTION**

***Claim Rejections - 35 USC § 102***

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 76, 79-82, 85, 87, 94-101, and 103-113 are rejected under 35 U.S.C. 102(e) as being anticipated by Asaki et al (U.S. 6,051,118).

As to claim 76, Asaki discloses in figures 2 and 3 an apparatus and a corresponding method of forming a land grid assembly module, said method comprising: preparing a cap (20) including sealing legs (5) respectively extending from peripheral ends of a first surface of said cap (20), and at least one integrally formed protrusion (4) on said first surface of said cap intermediate said sealing legs (5); and joining a substrate (1) to said sealing legs (5) to form a sealed module, said at least one protrusion (4) extending to a predetermined distance above a surface of the substrate (1) when the module is sealed, wherein a position of said at least one protrusion (4) is selectively adjustable in relation to said substrate (1) (see bolt 6 which could be adjustable in relation to the substrate 1), wherein during a load condition on said substrate (1), said at least one protrusion (4) suppresses an amount of flexing of said substrate (1).

As to claim 79, Asaki discloses in figures 2 and 3 an apparatus and a corresponding method, wherein said at least one protrusion (4) is formed on a same plane as a bottom surface of said cap (20).

As to claim 80, Asaki discloses in figures 2 and 3 an apparatus and a corresponding method, wherein said at least one protrusion (4) extends not completely to a surface of the substrate (when the protrusion is unscrewed) opposing said at least one protrusion.

As to claim 81, Asaki discloses in figures 2 and 3 an apparatus and a corresponding method, wherein said at least one protrusion (4) is preloaded against said substrate (1).

As to claim 82, Asaki discloses in figures 2 and 3 an apparatus and a corresponding method, wherein said at least one protrusion (4) is an opposite contact surface.

As to claim 85, Asaki discloses in figures 2 and 3 an apparatus and a corresponding method, wherein said at least one protrusion (4) includes a rounded surface (corresponding the rounded surface of plate 8).

As to claim 87, Asaki discloses in figures 2 and 3 an apparatus and a corresponding method, wherein said at least one protrusion (4) is located substantially near the center of said substrate (1).

As to claim 94, Asaki discloses in figures 2 and 3 an apparatus and a corresponding method, wherein said at least one protrusion comprises a screw (bolt 6).

As to claim 95, Asaki discloses in figures 2 and 3 an apparatus and a corresponding method, further comprising rotating said at least one protrusion to be threaded through said cap (20) to adjust a distance of a bottom of said protrusion (4) from a top surface of said substrate (1).

As to claim 96, Asaki discloses in figures 2 and 3 an apparatus and a corresponding method, wherein said at least one protrusion (4) comprises a rivet for being adjustably inserted through said cap (20).

As to claim 97, Asaki discloses in figures 2 and 3 an apparatus and a corresponding method, wherein said at least one protrusion (4) comprises a threaded cylindrical object.

As to claim 98, Asaki discloses in figures 2 and 3 an apparatus and a corresponding method, further comprising adjustably fitting said at least one protrusion (4) through said cap (20) such that a bottom surface of said at least one protrusion (4) is flush with a top surface of said substrate (1).

As to claim 99, Asaki discloses in figures 2 and 3 an apparatus and a corresponding method, wherein said at least one protrusion (4) is adjustably fitted to form a predetermined gap between a tip of said at least one protrusion and said substrate (1).

As to claim 100, Asaki discloses in figures 2 and 3 an apparatus and a corresponding method, wherein said at least one protrusion (4) includes threads which are sealed to prevent leakage and retain the protrusion position.

As to claim 101, Asaki discloses in figures 2 and 3 an apparatus and a corresponding method, wherein an interposing layer (9) of hardened material ("titanium") is interposed between said at least one protrusion (4) and said substrate (1) (see col. 6, lines 60-67).

As to claim 103, Asaki discloses in figures 2 and 3 an apparatus and a corresponding method, further comprising: forming a contact plate (8) formed on said substrate (1) for spreading a reaction load between said at least one protrusion (4) and said substrate (1).

As to claim 104, Asaki discloses in figures 2 and 3 an apparatus and a corresponding method, wherein said contact plate (8) comprises another material ("titanium") having a hardness substantially the same as steel.

As to claim 105, Asaki discloses in figures 2 and 3 an apparatus and a corresponding method, wherein said contact plate (8) comprises a column.

As to claim 106, Asaki discloses in figures 2 and 3 an apparatus and a corresponding method, wherein said contact plate (8) is attached to said substrate (1).

As to claim 107, Asaki discloses in figures 2 and 3 an apparatus and a corresponding method, wherein said contact plate (8) is pre-attached to a tip of said at least one protrusion (4).

As to claim 108, Asaki discloses in figures 2 and 3 an apparatus and a corresponding method, wherein said contact plate (8) is an opposite contact surface.

As to claim 109, Asaki discloses in figures 2 and 3 an apparatus and a corresponding method, wherein said contact plate (8) protects a surface of said substrate (1) from scratching damage.

As to claim 110, Asaki discloses in figures 2 and 3 an apparatus and a corresponding method, wherein said contact plate (8) protects said substrate (1) from excessive surface pressure.

As to claim 111, Asaki discloses in figures 2 and 3 an apparatus and a corresponding method, wherein said contact plate (8) is retained and located with a counterbore in said substrate (1).

As to claim 112, Asaki discloses in figures 2 and 3 an apparatus and a corresponding method, wherein said contact plate (8) includes at least one rounded contact surface for centered contact to said at least one protrusion (4).

As to claim 113, Asaki discloses in figures 2 and 3 an apparatus and a corresponding method of forming a land grid assembly module, said method comprising: preparing a cap (20)

Art Unit: 2822

including sealing legs (5) respectively extending from peripheral ends of a first surface of said cap (20), and at least one integrally formed protrusion (4) on said first surface of said cap intermediate said sealing legs (5); and joining a substrate (1) to said sealing legs (5) to form a sealed module, said at least one protrusion (4) extending to a predetermined distance above a surface of the substrate (1) when the module is sealed, and selectively adjusting a position of said at least one protrusion (4) in relation to said substrate (1) (see bolt 6 which could be adjustable in relation to the substrate 1), wherein during a load condition on said substrate (1), said at least one protrusion (4) suppresses an amount of flexing of said substrate (1).

***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claim 77 is rejected under 35 U.S.C. 103(a) as being unpatentable over Asaki et al (U.S. 6,051,118) in view of Atwood et al (U.S. 2001/0026957).

As to claim 77, Asaki does not disclose an apparatus and a corresponding method comprising: a cap is for mechanically protecting a chip mounted on said substrate, and for providing a heat transfer path from a back side of the chip to an external cooling environment.

Atwood et al discloses in figures 1-5 an apparatus and a corresponding method comprising: a cap (14) is for mechanically protecting a chip (IC chip) mounted on said substrate (10), and for providing a heat transfer path from a back side of the chip to an external cooling

Art Unit: 2822

environment (see col. 5, paragraph [0076]). Therefore, it would have been obvious to a person having ordinary skill in the art at the time the invention was made to modify the apparatus and a corresponding method of Asaki et al by using a cap for mechanically protecting a chip (IC chip) mounted on said substrate (10), and for providing a heat transfer path from a back side of the chip to an external cooling environment as taught by Atwood et al for protecting the chips and releasing heat from the chips mounted on the substrate.

5. Claim 78, 83-84, 86, 88 and 102 are rejected under 35 U.S.C. 103(a) as being unpatentable over Asaki et al (U.S. 6,051,118).

As to claim 78, Asaki discloses an apparatus and a corresponding method, wherein at least one protrusion (4) is a predetermined distance from an opposing surface of said substrate (1) during an unloaded state of said module.

Asaki does not disclose an apparatus and a corresponding method, wherein said predetermined distance being substantially within a range of about 0.000 inches to about 0.003 inches above the substrate surface. It would have been obvious to a person having ordinary skill in the art at the time the invention was made to modify the apparatus of Asaki by setting a range of about 0.000 inches to about 0.003 inches above the substrate surface for the predetermined distance of the protrusion for preventing damage to the substrate, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or working ranges involves only routine skill in the art. In re Aller, 105 USPQ 233.

As to claims 83 and 84, Asaki does not disclose an apparatus and a corresponding method, comprising capping the at least one protrusion with an elastomer layer; and the



Art Unit: 2822

elastomer member in an area of said substrate corresponding to said at least one protrusion. It would have been obvious to a person having ordinary skill in the art at the time the invention was made to modify the apparatus of Asaki by capping the at least one protrusion with an elastomer layer, and the elastomer member in an area of said substrate corresponding to said at least one protrusion for resiliently protecting the substrate from being damaged, since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. In re Leshin, 125 USPQ 416.

As to claim 86, Asaki does not disclose an apparatus and a corresponding method, the at least one protrusion is located substantially within a range of about  $1/3$  to about  $1/4$  the diagonal distance from a center to a corner of the substrate. It would have been obvious to a person having ordinary skill in the art at the time the invention was made to modify the apparatus of Asaki by having the at least one protrusion which is located substantially within a range of about  $1/3$  to about  $1/4$  the diagonal distance from a center to a corner of the substrate for supporting the cap, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or working ranges involves only routine skill in the art. In re Aller, 105 USPQ 233.

As to claim 88, Asaki discloses an apparatus and a corresponding method, wherein a bottom surface of said at least one protrusion (4) is substantially on a same plane as an interface between the bottom surface of the sealing legs (5) of the cap.

Asaki does not disclose an apparatus and a corresponding method, a clearance of substantially within a range of about 0.000 inches to about 0.003 inches, is provided between the

Art Unit: 2822

bottom of said at least one protrusion and the opposing surface of the substrate. It would have been obvious to a person having ordinary skill in the art at the time the invention was made to modify the apparatus of Asaki by having a clearance of substantially within a range of about 0.000 inches to about 0.003 inches, is provided between the bottom of said at least one protrusion and the opposing surface of the substrate for preventing damage to the substrate, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or working ranges involves only routine skill in the art. In re Aller, 105 USPQ 233.

As to claim 102, Asaki does not disclose an apparatus and a corresponding method, wherein said curable or hardened material comprises epoxy. It would have been obvious to a person having ordinary skill in the art at the time the invention was made to modify the apparatus of Asaki by using epoxy material for curable or hardened material for providing a good thermal conductivity, since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. In re Leshin, 125 USPQ 416.

### ***Conclusion***

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Heilbronner et al (U.S. 5,296,739) discloses circuit arrangement with a cooling member.

DiGiacomo et al (U.S. 5,981,310) discloses Multi-chip heat-sink cap assembly.


**Contact Information**

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thanh Y. Tran whose telephone number is (571) 272-2110. The examiner can normally be reached on M-F (9-6:30pm).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amir Zarabian can be reached on (571) 272-1852. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

TYT

  
**AMIR ZARABIAN**  
**SUPERVISORY PATENT EXAMINER**  
**TECHNOLOGY CENTER 2800**